

Giardiasis

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Section 1

ABOUT THE DISEASE

A. Etiologic Agent

Giardia intestinalis (formerly known as *Giardia lamblia*) is a protozoan parasite that has two forms: the infectious cyst and the invasive trophozoite. Infected persons can shed both trophozoites and cysts in stool.

B. Clinical Description

Symptoms of giardiasis are variable, but typically include watery, foul-smelling diarrhea. Abdominal cramps and a “bloated” feeling with excess gas often accompany the diarrhea. The diarrhea can be persistent or intermittent, and it can be accompanied by fatigue and steatorrhea (fatty stools). Anorexia, combined with malabsorption, can lead to significant weight loss, failure to thrive, and anemia. However, many infections are asymptomatic. In addition, the nature of immunity is uncertain. Some people with regular exposure may develop some degree of resistance to illness. Treatment failure is not uncommon (~10% of the time), but is not indicative of drug resistance of the parasite. A repeat course of the same medication may be indicated.

C. Vectors and Reservoirs

Humans and some animals (dogs, cats, rodents, cattle, deer, elk, beaver, and muskrats) are reservoirs, although the public health importance of most nonhuman reservoirs is debated. Overall, humans are the most important source of other human infections. Wildlife, such as deer, elk, and beaver, may be important in contaminating surface water supplies; domestic animals (e.g., dogs) may be a source for some human exposures.

D. Modes of Transmission

The principal mode of transmission of giardiasis is from person-to-person. Persons become infected by fecal-oral transfer of cysts from the feces of an infected individual, especially in institutions and daycare centers. Transmission can also occur from person-to-person through certain types of sexual contact (e.g., oral-anal contact). Localized outbreaks may occur from fecally contaminated water, such as streams/lakes and swimming pools that are open to contamination by human and animal feces. Eating food contaminated by an infected food handler can be a source, but this has been rarely documented.

E. Incubation Period

The incubation period can vary from 3–25 days (or longer); the median is 7–10 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes the organism, which may be many months.

G. Epidemiology

Giardiasis is the most common intestinal parasitic infection of humans in the US and globally, with a worldwide distribution. Children are infected more frequently than adults. Those at risk of becoming infected with *Giardia* include diaper-aged children in childcare settings, close contacts of people with *Giardia*, backpackers and hikers who drink unsafe water, international travelers who drink water or ice cubes made from untreated water, and people exposed to human feces through sexual contact. Surveys conducted in the US have demonstrated prevalence rates of *Giardia* in stool specimens that range from 5% to 7% depending on the location and age. Cases occur more commonly in the summer and fall months.

H. Bioterrorist Potential

This pathogen is not considered to be of risk for use in bioterrorism.

Section 2

REPORTING CRITERIA AND LABORATORY TESTING

A. What to Report to the Massachusetts Department of Public Health (MDPH)

Report laboratory-confirmed cases, defined as the detection of *Giardia* organisms, antigen, or DNA in stool, intestinal fluid, tissue samples, biopsy specimens, or other biological samples.

Note: See Section 3C for information on how to report a case.

B. Laboratory Testing Services Available

The Massachusetts State Public Health Laboratory (MA SPHL) does not perform testing for *Giardia*.

Section 3

REPORTING RESPONSIBILITIES AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (e.g., a diapered child, daycare attendee, or food handler), and if so, to prevent further transmission.
- To identify transmission sources of public health concern (e.g., a restaurant or a contaminated public water supply), and to stop transmission from such sources.

B. Laboratory and Health Care Provider Reporting Requirements

Giardiasis is reportable to the local board of health (LBOH). The MDPH requests that health care providers immediately report to the LBOH in the community where the case is diagnosed, all confirmed or suspect cases of giardiasis, as defined by the reporting criteria in Section 2A.

Laboratories performing examinations on any specimens derived from Massachusetts residents that yield evidence of *Giardia sp.* infection shall report such evidence of infection directly to the MDPH within 24 hours.

C. Local Board of Health (LBOH) Reporting and Follow-Up Responsibilities

Reporting Requirements

MDPH regulations (105 CMR 300.000) stipulate that giardiasis is reportable to the LBOH and that each LBOH must report any case of giardiasis or suspect case of giardiasis, as defined by the reporting criteria in Section 2A. Cases should be reported to the MDPH Bureau of Infectious Disease and Laboratory Sciences (BIDLS), Office of Integrated Surveillance and Informatics Services (ISIS) via MAVEN. Refer to the List of Diseases Reportable to Local Boards of Health for information on prioritization and timeliness requirements of reporting and case investigation

<http://www.mass.gov/eohhs/docs/dph/cdc/reporting/rprtbl diseases-lboh.pdf>

Case Investigation

It is the responsibility of the LBOH to complete all questions in each of the MAVEN question packages by interviewing the case and others who may be able to provide information. Much of the information required can be obtained from the health care provider or from the medical record.

Calling the provider

If the case was hospitalized (i.e. reporting facility is a hospital), call infection control at the named hospital. A list of infection preventionists can be found in the help section of MAVEN. If the case was seen at a clinician's office, ask to speak to a nurse working with the ordering provider.

Calling the case or parent/guardian of the case

Before calling the case, review the disease fact sheet by clicking on the Help Button located in MAVEN and/or reviewing all the information in this chapter. The call may take a few minutes, so in order to maximize the chance of getting the information needed, it might be good to note the potential length of the call with your contact, and offer the opportunity to call back when it is more convenient. Asking questions about how the case or child is feeling may get the case or parent talking. If you are unable to answer a question they have, don't hesitate to call the Division of Epidemiology and Immunization at 617-983-6800 for assistance, and call them back with the answer later. People are often more than willing to talk about their illness, and they may be very happy to speak with someone who can answer their questions.

Using MAVEN

Administrative Question Package

Monitor your "Online LBOH Notification for non-Immediate Disease" workflow in MAVEN for any new cases of *Giardiasis*. Once a new event appears in this workflow, open the Administrative Question Package (QP) and under the "Local Health and Investigation" section, answer the first question "**Step 1 - LBOH acknowledged**" by selecting "Yes". The "LBOH acknowledged date" will then auto populate to the current day. Completing this first step will move the event out of this workflow and into your "Online

LBOH notified but Case Report Forms (CRF) are pending” workflow. Note the date you started your investigation by answering “**Step 2** – Investigation started” as “Yes” and then note the date where shown. Record your name, agency, and phone numbers where shown in “**Step 3** - LBOH/Agency Investigator.”

Demographic Question Package

Record all demographic and employment information. It is particularly important to complete the Race/Ethnicity and Occupation questions.

Clinical Question Package

Complete the “Diagnosis/Clinical Information” section, providing the diagnosis date, symptom information and date of symptom onset and other medical information

Risk Exposure/Control & Prevention Question Package

Accurately record all risk questions regarding travel and consumption of any high risk foods. As you enter data into MAVEN, additional questions will appear for you to answer regarding risk/exposure.

Completing your Investigation

1. If you are finished with your investigation and follow-up is complete, mark “**Step 4** – Case Report Form Completed” as “Yes” and then choose Local Board of Health (LBOH) –Ready for MDPH review for the “Completed by” variable.
2. If you have made several attempts to obtain case information but have been unsuccessful (e.g., the case or health care provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please complete “**Step 4** - Case Report Form Completed” as “No” and then choose a primary reason why the case investigation was not completed from the choices provided in the primary reason answer variable list.
3. If you are not online for MAVEN you may submit a paper case report form. After completing the form, attach laboratory report(s) and fax or mail (in an envelope marked “Confidential”) to ISIS. The confidential fax number is (617) 983-6813. Call ISIS at (617) 983-6801 to obtain a copy of the case report form and to confirm receipt of your fax.

The mailing address is:

MDPH, Office of Integrated Surveillance and Informatics Services (ISIS)
305 South Street, 5th Floor
Jamaica Plain, MA 02130
Fax: (617) 983-6813

Section 4

CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (105 CMR 300.200)

Food handlers with giardiasis must be excluded from work.

Note: A case of giardiasis is defined by the reporting criteria in Section 2A of this chapter.

Minimum Period of Isolation of Patient

After diarrhea has resolved, food handling facility employees may return to work only after producing one negative stool specimen. If a case has been treated with an antimicrobial, the stool specimen shall not be collected until at least 48 hours after cessation of therapy. In outbreak circumstances, a second consecutive negative stool specimen is required prior to returning to work.

Minimum Period of Quarantine of Contacts

Contacts with diarrhea who are food handling facility employees shall be considered the same as a case and shall be handled in the same fashion. In outbreak circumstances, asymptomatic contacts who are food handling facility employees shall be required to produce two negative stool specimens, 24 hours apart. No restrictions otherwise.

Note: A food handler is any person directly preparing or handling food. This can include a patient care or childcare provider.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare

Since giardiasis may be transmitted from person to person through fecal-oral transmission, it is important to follow up on cases of giardiasis in a daycare setting carefully. General recommendations include:

- Children with giardiasis who have diarrhea should be excluded until their diarrhea is resolved.
- Children with giardiasis who have no diarrhea and are otherwise not ill may be excluded or they may remain in the program, if special precautions are taken. Since most staff in childcare programs are considered food handlers, those with *Giardia* in their stools (symptomatic or not) can remain on-site but must not prepare food or feed children until their diarrhea is resolved and they have one negative stool test (collected at least 48 hours after completion of antibiotic therapy, if antibiotics are given) (per 105 CMR 300.200).
- Notifying parents/guardians of attendees should be considered when cases of giardiasis occur in children or staff. Licensed daycare facilities must notify all parents in accordance with MDPH recommendations when any communicable disease or condition has been introduced into the program (606 CMR 7.11). MDPH epidemiologists are available to help determine whether notification is recommended and sample letters are available from the Division of Epidemiology and Immunization at (617) 983-6800.

School

Since giardiasis may be transmitted from person to person through fecal-oral transmission, it is important to investigate cases of giardiasis in a school setting carefully. The MDPH [Comprehensive School Health Manual](#) provides detailed information on case follow-up and control in a school setting. General recommendations include:

- Students or staff with giardiasis who have diarrhea should be excluded until their diarrhea is resolved.
- Students or staff with giardiasis who do not handle food, have no diarrhea or mild diarrhea, and are not otherwise sick may remain in school if special precautions are taken.
- Students or staff who handle food and have *Giardia* infection (symptomatic or not) must not prepare food until their diarrhea is resolved and they have one negative stool test (collected at least 48 hours after completion of antimicrobial therapy, if antimicrobial agents are given) (per 105 CM 300.200).
- The school nurse and school physician should consult with the local board of health and the MDPH epidemiologists to determine whether some or all parents/guardians and staff should be notified. Parent/guardian notification should be discussed with the school administrator prior to initiation. Sample letters are available from the Division of Epidemiology and Immunization at (617) 983-6800.

Refer to the MDPH *Comprehensive School Health Manual* for complete guidelines on handling diseases spread through the intestinal tract.

Community Residential Programs

Actions taken in response to a case of giardiasis in a community residential program will depend on the type of program and the level of functioning of the residents.

In long-term care facilities, residents with giardiasis should be maintained on standard (including enteric) precautions until their symptoms subside and they test negative for *Giardia*. Refer to the MDPH Division of Epidemiology and Immunization's Long Term Care Infection Control Guidelines <http://www.mass.gov/eohhs/gov/departments/dph/programs/id/epidemiology/providers/infection-control.html> for further actions. Staff members who provide direct patient care (e.g., feed patients, give mouth or denture care, or give medications) are considered food handlers and are subject to food handler restrictions (per 105 CMR 300.200). See Section 4A for more information. In addition, staff members with giardiasis who are not food handlers should not work until their diarrhea is resolved.

Reported Incidence Is Higher Than Usual/Outbreak Suspected

If the number of reported cases of giardiasis in your city/town is higher than usual, or if you suspect an outbreak, investigate to determine the source of infection and the mode of transmission. A common vehicle (e.g., water, food, or association with a daycare center) should be sought, and applicable preventive or control measures should be instituted (e.g., removing an implicated food item from the environment). Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist on-call at the MDPH Division of Epidemiology and Immunization at (617) 983-6800. The MDPH epidemiologists can help determine a course of action to

prevent further cases and can perform surveillance for cases across town lines, which would otherwise be difficult to identify at the local level.

Note: Refer to the MDPH Foodborne Illness Investigation and Control Reference Manual for comprehensive information on investigating foodborne illness complaints and outbreaks. This manual can be located at <http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/food-safety/foodborne-illness/tools/foodborne-illness-investigations-and-control.html>. For the most recent changes to the Massachusetts Food Code, contact the Food Protection Program (FPP) at (617) 983-6712 or through the MDPH website at www.mass.gov/dph/fpp.

D. Preventive Measures

Personal Preventive Measures/Education

To avoid exposure, recommend that individuals:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet, and after changing diapers.
- Wash their own hands as well as the child's hands after changing diapers, and dispose of the diapers in a sanitary manner.
- Wash their own hands when caring for someone with diarrhea. Hands should be scrubbed with plenty of soap and water after cleaning the bathroom, after helping the person use the toilet, or after changing diapers, soiled clothes, or soiled sheets.
- Be aware of the risks of drinking water from streams or lakes when hiking or camping. Bringing water to a full, rolling boil is sufficient to kill *Giardia*. Several filters are also available that remove *Giardia* cysts. Additionally, some chemical disinfectants are effective against *Giardia*.

Discuss transmission risks that may result from oral-anal sexual contact. Latex barrier protection (e.g., dental dam) may prevent the spread of giardiasis to a case's sexual partners and may prevent exposure to and transmission of other fecal-oral pathogens.

International Travel

Travelers to developing countries should:

- "Boil it, cook it, peel it, or forget it."
- Drink only boiled water or bottled carbonated beverages, keeping in mind that bottled carbonated water is safer than bottled non-carbonated water.
- Ask for drinks without ice, unless the ice is made from boiled water. Avoid popsicles and flavored ice that may have been made with contaminated water.

- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel their own raw fruits or vegetables and not eat the peelings.
- Avoid foods and beverages from street vendors.

A *Giardia* Public Health Fact Sheet is available from the Division of Epidemiology and Immunization or on the MDPH website at <http://www.mass.gov/eohhs/docs/dph/cdc/factsheets/g-i/giardia.pdf>.

Note: For more information regarding international travel, contact the Centers for Disease Control and Prevention (CDC) Traveler's Health Office at (877) 394-8747 or online at www.cdc.gov/travel.

ADDITIONAL INFORMATION

The formal CDC surveillance case definition for giardiasis is the same as the criteria outlined in Section 2A of this chapter. (The CDC and the MDPH use the CDC case definitions to maintain uniform standards for national reporting.) For reporting to the MDPH, always use the criteria outlined in Section 2A.

Note: The most up-to-date CDC case definitions are available on the CDC website at <http://wwwn.cdc.gov/nndss/conditions/giardiasis/case-definition/2011/>

REFERENCES

American Academy of Pediatrics. [*Giardia intestinalis* Infections.] In: Pickering L.K., ed. *Red Book: 2015 Report of the Committee on Infectious Diseases, 30th Edition*. Elk Grove Village, IL, American Academy of Pediatrics; 2015: 353-355.

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Heymann, D., ed. *Control of Communicable Diseases Manual, 20th Edition*. Washington, DC, American Public Health Association, 2015.